The symbiosis of failure: The strategic dynamics of risk and resilience

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Abstract

This chapter is concerned with a consideration of the factors that shape the relationships between risk management and the strategy processes and which serve to erode organisational resilience as a consequence. The academic literature highlights the widespread acceptance of the need for an effective relationship between strategy and risk management, but it also acknowledges that they are not fully integrated in practice. The chapter seeks to identify some of the reasons why this dislocation occurs and it sets out four core issues that are held to be important within this context. These four elements are captured by the acronym RITA in which the processes around Risk, Indeterminacy, Transformations, and Acceptability are used as a basis to consider some of the wider problems that emerge within organisations. The RITA elements are held to interact with each other to generate a level of complexity that challenges the core capabilities and competencies of the organisation and which need to be considered within the context of its strategy. The chapter argues that the effective integration of risk and strategic management require a holistic approach be taken by organisations – a task for which they are currently ill-prepared.

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Introduction

> "*if an event or a kind of behavior meets a predetermined criterion, whatever the criterion is, then we say it is a success. If the criterion is violated, then a failure occurs*" - (Cai, 1996, p. 115).

> "*Adding the word failure implies that an abnormality has to be rectified through some intervention process*" (Hughes, 2007, p. 97).

The notion of failure permeates many aspects of society. News reports provide accounts of failures in service provision as well as the failures of professionals to protect those in their care. There are also accounts of failures in the products and core processes of organisations, sometimes with catastrophic consequences. Even governments are not immune from failures of policy. In all cases, the questions that are asked after the event are essentially along the lines of 'how could this happen, why were the risks of failure not identified and acted upon'? Any discussion of failure, whether it is framed in terms of - healthcare interventions, engineering, policy making, or management practices, amongst others - is plagued by a core problem of the definition of failure when framed within a particular context (Morris, LaForge, & Allen, 1994; Watson & Everett, 1999). Even in the areas of risk and resilience the definition of 'failure' (along with that of crisis) and its relationship to other terms has been the source of some ambiguity (Smith, 2006; Smith & Fischbacher, 2009). Failure is, therefore in many respects, in the eyes of the beholder, but as a systems state it does not exist in isolation. Failure is also dependent on a range of elements that are at work within the system and against which that 'failure' is judged. This symbiotic nature of failure and its relationships to wider processes around strategy sits at the core of the literature on risk and resilience. Irrespective on the definition of failure used, there is a sense that when failure occurs then the objectives of the system have not been met in full and that the host organisation has not been operating at the level of effectiveness required to prevent that failure.

In commenting on the nature of failure in healthcare, Hughes (2007), in the opening quote, highlights the notion that failure implies that there is some abnormality that needs to be addressed, thereby suggesting that any corrective action taken by the organisation has the potential to rectify this abnormal phenomenon. One might argue that risk, resilience, and crisis management each have a focus on these

processes of intervention by seeking to identify, prevent, and respond to those organisational abnormalities that have the potential to cause harm. There is a case to be made, therefore, for linking these processes around risk to the wider mechanisms by which strategy is developed and operationalized (Mitroff, Pearson, & Pauchant, 1992; Power, 2005; Smith, 1992) with a goal of achieving effective performance around resilience (Fischbacher-Smith, 2014b). Within the literature, there is considerable agreement that organisations need to consider the nature of risk as an integral part of the strategic management process, but there appears to be a dislocation between these aspirations to integrate the processes conceptually and the realities of practice (Mikes, 2009, 2011). Recent work on resilience has recognised that its processes have an inherently strategic nature and that embedding these demands in the structures and processes of organisations and communities should be a core aspect of that approach (Carmeli & Markman, 2011; Hamel & Valikangas, 2003; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008; Somers, 2009). The obvious question to pose then is why, when there is considerable agreement of the significance of the relationships between risk, resilience, and strategy, are the relationships between them appear to be so fractured?

The demand for greater certainty around the management of risk is a long-standing challenge for management and one that has transcended a number of organisational contexts in which risk is considered (see, for example, Irwin, Smith, & Griffiths, 1982; Mikes, 2009; Power, 2004, 2008). This search for greater certainty has become an ever-more elusive construct as organisational systems become increasingly complex, operate over longer distances, and have to contend with increasing demands for certainty and control.

Our aim in this chapter is to consider this question and it does so by considering how four inter-related elements of the failure process can interact together to generate problems for organisations in integrating resilience (as capability) and strategy (as intent). In addition to dealing with some of the ambiguities and nuances around the nature of risk, the chapter sets out three other elements that are relevant to shaping strategic failures. The first of these concerns the indeterminate nature of many of the hazards facing organisations, especially within a highly connected and complex environment. Secondly, it highlights the importance of transformation processes within the emergence of new forms of hazard and the organisation's responses to those challenges. Finally, it considers the ways in which the range of

hazards facing the organisation are framed and judged to be acceptable, or otherwise, by key decision-makers. These four elements – set out using the acronym RITA – are used to highlight the scale of the underlying issues that inhibit organisations from taking a more holistic perspective on the relationships between failure and strategy. The chapter seeks to contextualise these issues by setting the challenges that they present within the processes of risk and resilience research and to frame them within the wider contexts of strategic management that operate within organisations. The core argument developed here concerns the nature and utilisation of knowledge by managers within the context of uncertain and highly damaging events. In essence, the chapter seeks to consider how organisations deal with an ever more complicated portfolio of hazards and do so within a complex environment where the potential for emergent conditions is high. The discussions reflect the literatures on what Mikes (2009) has termed "calculative cultures", in which the power of technical expertise has been a dominant element in the determination of risk. As a first step in exploring the challenges for the strategic management of from these issues, we first need to reflect on the nature of organisational failure.

Organisational failure – fragments of a failure in strategy

> "The future is totally unpredictable. Organizations are unpredictable. Efforts to control organizations are futile, even harmful to organizations. Planning stifles strategic thinking. What is to be done?.....Surprisingly, there is much that can be done……" - (Sherden, 1998, p. 241)

> "any attempt to explain organizational failure will not be complete unless the interplay between contextual forces and organizational dynamics is taken into account" - (Mellahi & Wilkinson, 2004, p. 34.).

These two quotes highlight the pervasive nature of organisational failure, the holistic causal factors that generate it, the role of uncertainty as a critical element within the management of risk, and the constraints around attempts at organisational control. At its core, failure can be seen an essentially perceptual construct. Within our daily organisational lives we can see failure defined and redefined depending on the vantage point and vested interest of the individual who is making the judgement. There are, of course, clearly defined failures within organisations that are not easily reconfigured, no matter how effective the organisation's public relations capabilities

might be. Catastrophic accidents, especially those involving loss of life and resource, cannot be easily redefined in a positive light. They point to the ineffectiveness of the organisation in controlling its activities and the failure of managers to anticipate and prevent these adverse events from occurring (Fischbacher-Smith, 2014a). It is with such catastrophic forms of failure that have clear strategic impacts that this essay is concerned.

There is little doubt that failures within the core technologies and processes of an organisation can generate problems for its strategy, especially where that organisation is already experiencing problems. For example, the loss of two Malaysia Airlines aircraft in 2014, both in controversial circumstances, led to a severe decline in the company's share price and resulted in job cuts and the development of a revised strategy to turn the company around (Topham, 2015). Conversely, an organisation's strategy can also shape the generation of the conditions that lead to catastrophic failure (Turner, 1976). An example of this relationship can be found in the accident on board the Deepwater Horizon oil-rig that resulted in loss of life, severe environmental impact, and which has been seen as a failure in the governance processes within the strategy of deep-water drilling (Osofsky, 2013). This accident ultimately generated a multi-level crisis for both BP and the US Government (Audra & Jennie, 2013; Smithson & Venette, 2013). Its genesis, however, could be seen to lie in the heavy dependence that Western countries have on oil imports and the geo-politics of the oil-producing regions. These factors have resulted in the search for additional sources of hydrocarbon resources, often in increasingly hostile environments with the attendant risks of working in such a setting. In the aftermath of the accident, the role of politicians in shaping a risky strategy of deep water drilling was overshadowed by the blame that fell on BP as the main contractor. Whilst BP clearly bears responsibility for the accident, they are not the only villains in the case (Houck, 2010). On the basis of these examples alone, it could be argued that that risk and resilience are intrinsically linked to the strategic management process in what amounts to a symbiotic relationship – each has the potential to feed off the other. Why then are these processes not considered more systematically and holistically by organisations, academic research, and business education?

The globalised nature of modern organisations ensures that the interactions between elements of the RITA acronym occur across space and time and this adds a layer of complexity for managers to contend with. Highly interconnected

organisations may experience a crisis if the vulnerabilities that are inherent in the organisation are exposed at points within this global landscape of activities. Mellahi and Wilkinson remind us of the importance of the various interactions that occur both within the organisation and as a result of its interaction with its environmental contexts. The plurality of environmental settings in which organisations operate, across a global network of interactions, serves to create fractures in organisational controls that generate varying degrees of vulnerability at different points in space-time. The distributed and interconnected nature of supply chains and the instantaneous coverage of catastrophic events by global news networks will ensure that the reputational aspects of any crisis become problematic for organisations. The range of task demands generated by shifts in the relationships between an organisation's environment and its capabilities has the effect of moving an organisation away from its designed-for state. They do so in a way that can create conditions that can exceed the contingency capabilities that are in place to deal with the anticipated perturbations that may affect the wider system (Hodge & Coronado, 2007; Smith, 2005; Tsoukas, 1999). As organisations extend the scale and locations of their activities, they increase the interactions that occur between the elements of that wider system. The result is the creation of a complex mosaic of interactions that generate emergent conditions, which then serve to challenge the dynamic capabilities (Eisenhardt & Martin, 2000; Teece & Pisano, 1994) that the organisation has in place. These perturbations can also create the conditions where the various control systems that are in place are unable to prevent failure from occurring (Fischbacher-Smith, 2014b; Smith, 2005).

Failure is often defined in multiple ways depending on the circumstances in which it is judged (Dörner, 1996) but it is seen as both pervasive and inevitable, especially in socio-technical systems (Petroski, 1985). At an organisational level, failure can be seen to occur when the organisation does not have sufficient fit between its internal capabilities and the external task demands imposed upon it (Miles & Snow, 1994). The notion of 'misfit' is identified by Miles and Snow as a critical element in the failure process but it is also one that is seen to defy prediction on occasions:

> "Occasional situations of misfit and failure are beyond managerial anticipation and/or influence…….. managers cannot forsee or prevent some forms of organizational failure" (Miles & Snow, 1994, p. 66)

Thus, the abilities of management, as both a functional area and as a set of processes, are central to the generation of failure conditions, and do so as a result of acts of commission or omission by managers operating over space and time. The result is the incubation of failure potential and this has been an issue that has attracted considerable attention (Collingridge, 1992; Reason, 1990, 1993a; Turner, 1978, 1994a). The incremental nature of the incubation process is seen to be of importance:

> "One of the most troublesome aspects of misfit and failure is that the process by which they occur is incremental, interactive, and cumulative. If harmful changes occur over a long enough period, both the changes and the adaptations made to them may well become so deeply ingrained in the organization that the next generation of manager takes them as given" (Miles & Snow, 1994, p. 68)

The situation becomes more complicated when human actors are involved in the failure process. Human actions that serve to precipitate failure can be accidental (slips and lapses) or intentional acts (mistakes and violations) (Reason, 1990) and both groups of actions can create significant challenges around the development and maintenance of control. In addition, these actions can be latent (delayed in effect) or active (immediate in effect), with the result that human interventions have the potential to shape the conditions of failure at multiple levels and across different timelines. In addition to generating the conditions that precipitate strategic failure, human actions can also serve to erode the processes around mitigation and control. As a consequence, the processes around failure can be seen to be intrinsically linked to the actions of human operators – through the decision-making process, the manner in which technical expertise is used to justify decisions (especially where the extent of uncertainty is high), and the acceptability of key decisions involving risk and uncertainty. Failure is, therefore, a term that is related to a number of other elements that coalesce around it.

The strategic nature of organisational failure (in its various guises) is a concept that has a long history within the academic literature (Pauchant & Mitroff, 1992; Reason, 1993a, 1997; Smith, 1992, 1995; Tenner, 1996; Turner, 1978, 1994a). Despite this history, business schools have been seen as somewhat reluctant to incorporate crisis concepts within mainstream programmes (Comer, 2013) and to do so in a manner that recognises the role that managerial decision-making plays in the process (Fischbacher-Smith & Fischbacher-Smith, 2013). These decisions can generate acute problems around failures by creating the conditions for active errors,

whilst also generating more chronic (or latent) errors (Collingridge, 1992; Reason, 1990, 1993b). As a result, the relationships between the strategy process and failure can be seen to operate at two levels. The first occurs as a result of the creation of a set of conditions in which human operators working within the socio-technical system are forced into error traps (Reason, 1987, 1990). The second, relates to the decisions that are taken in one time period in which their consequences are not immediately realised but instead the error cost is embedded, or incubated, within the system (Collingridge, 1992; Turner, 1978, 1994a). Inherent in both forms of error generation are a range of processes around the generation of uncertainty within the decision-making process and the manner in which expertise and the organisation's knowledge base is brought to bear on the decision problem.

The actions of managers in designing, shaping, and adapting these controls, or by generating activities that can exceed their boundaries, can create additional vulnerabilities within the organisation (Reason, 1997; Turner, 1994a). For some, this terrain of activities represents failures of both foresight and hindsight in which the set of problematic practices that have emerged have the potential to cause harm (Reason, 1997; Toft & Reynolds, 1994; Turner, 1978). If we add to this the intentional actions of hostile actors – those malevolent individuals who actively seek to cause harm by exposing vulnerabilities in controls – then any control processes have to be able to constantly adapt to meet the demands of an ever-changing threat matrix. Any such adaption needs to occur without creating further emergent conditions that can lead to new forms of unrecognised vulnerability. This is often especially problematic when those vulnerabilities occur in the underpinning critical infrastructures on which organisations rely, but which lie outside of their control, and are therefore effectively ignored (Boin & Smith, 2006). The result is the generation of what is effectively an arms race between a set of emergent conditions that are constantly evolving and a set of controls that management has put in place to prevent certain harmful events from occurring.

Organisations are, therefore, faced with a set of operational and strategic challenges around the management of hazards and the associated failure potential. These challenges include: the collection, analysis, synthesis, and distribution of information relating to systems performance; the maintenance of capabilities that allow for the control of processes, technologies, and material flows and transformations; the effective control of human resources on an increasingly global

scale and in a way that negates any threats arising from hostile insiders; and the management of a range of transformative processes that operate at different levels of scale, speed and reach in ways that reflect the balance between effectiveness, efficiencies, and the risk of failure. These issues generate both considerable and challenging task demands for the strategic management of organisations.

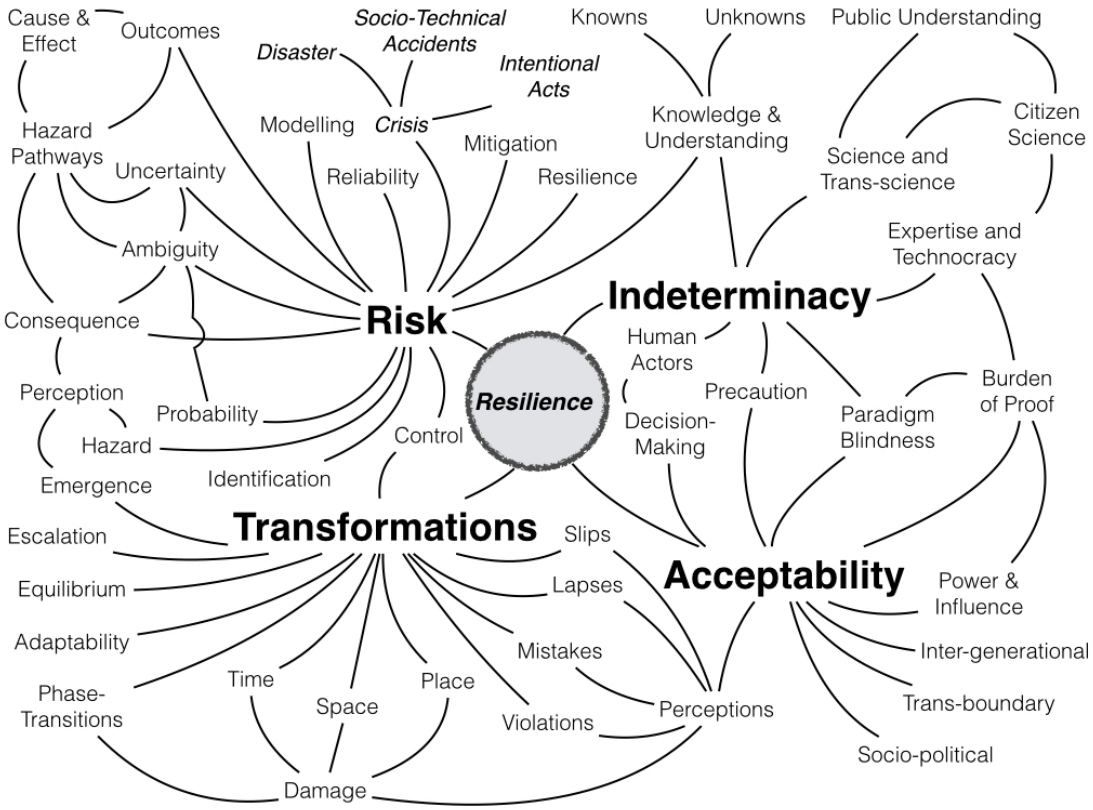
The intellectual and practical challenge for managers is to be able to identify and act on a range of such failure modes and effects – a task for which, it could be argued, the management function is invariably ill-prepared. In part, this is a function of the difficulties associated with the control of a diverse, but essentially synergistic, range of potential hazards and the requirement to manage them over increased spatial and temporal contexts. Given the highly interactive and coupled nature of modern organisations, it is not surprising that the speed and range of these failures can often generate the potential for catastrophic failure (Perrow, 1981, 1984, 2011) and confound attempts at prediction. A particular problem in prediction concerns that category of failures described as extreme events (low probability-high consequence hazards), as these are often deemed to be of such a low probability of occurrence that effective control mechanisms are not put in place to deal with them. The assumption is often made that existing controls will prevent the escalation of any perturbation so that it does not reach the point of catastrophic failure. This 'Titanic Syndrome' (Smith, 1995) – in which the belief in the reliability of the technology or the organisation's capabilities is such that effective contingency plans are not put in place - can lead to the suppression of concerns about potential failure modes or mitigations strategies because there is no a priori evidence to support such a failure scenario.

One of the challenges here concerns this predictive capability of risk analysis. Risk analytical techniques are at their strongest when dealing with phenomena where the failure modes and effects are known and understood and where the probabilities associated with such failures are also known and with a reasonable degree of accuracy. Invariably, this predictive capability is eroded when the issues considered are strategic rather than operational. Space and time also contribute to this increased uncertainty as they increase the potential for emergent conditions to generate intervening variables that confound the predictive process.

Figure 1 takes the challenges around risk and the three other elements that were identified earlier in the paper using the RITA acronym and highlights a range of additional issues that are felt to have an impact on the strategic dynamics of failure.

We can now turn our attention briefly to each of the major elements of this framework, starting with the ambiguities that are present within the processes around risk itself.

Figure 1 – the nature of failure and resilient organisations



The ambiguities of risk

Risk, and the manner in which the ambiguities within it are incorporated into decision-making, have been widely discussed within the academic literature (Curley, Yates, & Abrams, 1986; Ellsberg, 1961; Haisley & Weber, 2010; Knight, 1921; Rigotti & Shannon, 2012). The ambiguities inherent within a risk-based problem have been shown to impact upon the perceptions that individuals have of that risk (Camerer & Weber, 1992; Ghosh & Ray, 1997; Riddel, 2009) and these ambiguities can be

related to the understanding of the phenomena, its probabilities of occurrence and the associated consequences of the hazard, along with the manner in which information about that hazard is communicated and evaluated (Fox & Tversky, 1995; Frisch & Baron, 1988). Against such a background it is not surprising that organisations seem to struggle to incorporate risk-related concepts into their strategies in a way that is both transparent and meaningful. A core element that is associated with the generation of such ambiguities around risk, concerns the definition of the main elements of the term.

At a basic level, risk can be seen to consist of: a source of hazard or harm that has been identified; the probability of that hazard being realised; and the consequences that are associated with it. For many forms of hazard, there is considerable uncertainty relating to the cause and effect relationships that exist within a particular set of hazard pathways. The interactions between these elements of risk assessment can also serve to generate a set of challenges around the ways in which we attempt to manage that risk. Thus, we can argue that whilst the concept of risk may have its origins in actuarial approaches to failure (Sherden, 1998), it does not provide the certainty around cause and effect that such actuarial approaches might imply. Neither does it always provide a sense of the predictive validity around the probabilities attributed to different forms of hazard. It is because of the complexities within the management of risk that some have argued that it is essentially a social construction (Beck, 1992; Nelkin, 1989; Short, 1984). Such views are clearly at odds with those held in many parts of the risk industry, but the reality is likely to be somewhere between the two extremes. For certain types of risk it is possible to calculate group-based probabilities for harm – the life insurance industry is based on such calculations - however, such group-based approaches cannot accurately predict such risks at the level of the individual due to the intervening variables that can impact on those individuals. Thus, one might argue that risk analysis is essentially indicative rather than predictive, and that the interpretation of the information available in risk assessments becomes a social construction as a consequence (Beck, 1992; Douglas & Wildavsky, 1982). If we extend the processes around risk generation over space and time, then the strategic nature of risk management becomes an even more complex task and it begins to encompass much more of the uncertainty facing decision-makers.

Conventional risk analytical tools are at their strongest when dealing with events that have an actuarial basis for analysis, where the frequency of occurrence is such that it allows for the assessment of the probabilities of failure and does so with a high degree of reliability. For low probability, high consequence events, or those events involving human agency, actuarial approaches to determining risk are invariably more problematic. Within this context, uncertainty drives the decision making process and the knowledge available to decision-makers becomes a key factor in determining organisational effectiveness. When those decisions are extended in space and time and the cause and effect relationships between elements are correspondingly difficult to identify, then the processes around the use of risk analysis becomes more problematic. Even within routine decision problems, uncertainty plays an important role in shaping the actions of organisations and especially the human operators within them. Uncertainty is, therefore, a critical element with the processes of managing harmful events. If there is no uncertainty then there will be no need for individuals and groups to make a decision as the outcomes will be known and understood by all parties concerned – risk will, therefore, be predictable. Managers, it could be argued, exist to deal with this uncertainty but they may also play a significant role in shaping it as a function of their behaviours, decisions, knowledge, and understanding. In particular, the ways in which expert judgment and leadership style can contribute to the potential for failure is an important element in the embedding of error cost within the strategy process.

The management of 'risk' should be a central component of management practices, especially within a strategic context. However, despite its significance, it can be seen as being largely a marginal element of management theory (especially in terms of strategy) and certainly does not seem to occupy the central role within the practice agenda that one might expect (Bolton & Galloway, 2014; Currie, Knights, & Starkey, 2010; Fischbacher-Smith & Fischbacher-Smith, 2013; Mikes, 2009). Whilst there is little doubt that the attention given to risk has increased over the last thirty years, the pervasive nature of its role within organisations remains something an elusive challenge for organisational scholars. There are several reasons why the management of risk has proved problematic. These include: the need for risk management to be holistic in its approach (Bolton & Galloway, 2014), the development of "calculative cultures" (Mikes, 2009) that often assume that risks can be effectively predicted and controlled; the meanings and ambiguities of the various

terms that are associated with risk: and the requirements for risk management to reflect a range of knowledge domains and managerial spans of control.

Much of the debate within the academic literature has looked at risk in the aftermath of major adverse events (Dörner, 1996; Girerenzer, 2002; Knight, 1921; Reason, 1997; Shubik, 1954; Turner, 1978) and this discussion has taken on a new perspective within the post-modern approaches to dealing with the nature of hazard, especially within the context of a globalised environment (Fox, 1999; Giddens, 1990, 1999). It is in this interconnected environment that 'risk' has become a central element of debates and a central dynamic of the discussion relates to the ways in which the nature of risk is constructed, perceived and acted upon. Within this globalised setting, risk is also framed in terms of the relationships between cause and effect which can be extended across space and time, with the spatial and intergenerational effects of the hazards ultimately proving to be significant factors in their management (Fischbacher-Smith & Hudson, 2010; Hudson, 2009). This has created tensions around the role of technical expertise within risk-based decision-making, the burden of proof, and the ways in which powerful interests can serve to shape debates around risk generation (Collingridge & Reeve, 1986; Oreskes, 2004; Pigliucci & Boudry, 2014; Walton, 1988).

The management of risk and its relationship to social expectations creates a series of challenges for the decision-making processes within organisations (Douglas & Wildavsky, 1982; Power, 2008, 2009). Social expectations are such that there are demands around the prediction of risk that cannot be delivered (Power, 2004, 2009) and this generates organisational responses around the production of structured analyses in an attempt to determine what is essentially the indeterminate probability and consequences of hazards. The result is the creation of an ever more complex set of analyses and the generation of a calculative culture (Mikes, 2009) in which the technocratic processes involved effectively serve to over-rule accountability by making the processes of risk analysis more opaque to strategic decision-makers. Within this context any ambiguities within the process of analysing risk have the potential to generate additional indeterminate problems due to the lack of an effective burden of proof and the interventions from different 'expert' groups.

Indeterminacy and Uncertainty in the generation of strategic failure

> "Uncertainty creates problems for action. Actors' organizations resolve these problems by following rules of thumb, using rituals, relying on habitual patterns, or, more self-consciously, by setting goals and making plans to reach them. These devices provide the determinateness and certainty needed to embark upon organizational action in the present" – (Turner, 1976), p. 378.

A key aspect of the challenge around risk assessment relates to the indeterminate nature of some of the information available to decision-makers and this challenges the nature of the knowledge and understanding in those areas where the accuracy of that information is critical. This has echoes of Rumsfeld's (2002, 2011) notion of what is known and the range of things that remain unknown. In the case of the latter, it is possible for organisations to be aware of the limitations of their knowledge (the known unknowns), but there is also the potential for some of this knowledge to be indeterminate (the unknown unknowns). These unknown unknowns can arise from a number of factors.

Firstly, the nature of complexity within the socio-technical systems in which the failure is situated serves to undermine deterministic and calculative approaches to prediction (Sherden, 1998). The nature of emergent conditions within complex systems –essentially those unforeseen elements that arise out of the interactions between systems components – serves to generate problems around predicting likely event scenarios (Smith, 2005). Secondly, the situational context in which such risk assessments are undertaken is also seen to be problematic (Sherden, 1998). Here, psychological processes that impact upon decision-making play a major role in shaping the ways in which we see the world (Kahneman, 2011; Sabatier, 1987, 1988; Weick, 1993, 1995). The core beliefs, values and assumptions of decision-makers are important elements in serving to shape the ways in which they see the world (Fischbacher-Smith, 2012; Pauchant & Mitroff, 1992). Thirdly, and in a related manner, the nature of expert judgement is also a key element of the process of determining risk, but one that can be coerced by powerful interests (Collingridge & Reeve, 1986). Finally, the prediction of failure becomes more problematic as we extend that assessment out over space and time, thereby encompassing more uncertainty into the decision-making process.

Despite the limitations of our abilities to deal with the indeterminate nature of many forms of hazard and the constraints that exist around our knowledge and

understanding, organisations are willing to make a set of assumptions about the nature of the hazards that they face. They then use those assumptions to design the parameters of the control systems that are put in place. Turner (1976) highlights the ways in which such assumptions around routine processes can lead to the incubation of failure as the realities of systems performance become markedly different from the perceived parameters of that system in its designed-for state. Socio-technical systems generate emergent conditions that can result in sudden, unforeseen task demands that further compound the problems around decision-making and the performance of organisational controls (Gavetti, 2005; Jackson & Dutton, 1988; Kiesler & Sproull, 1982; Smith, 2005). In this context, the knowledge base of the organisation and the nature of technical expertise within it, are important elements in shaping the discourse around risk and uncertainty. It is here, that the notion of what the organisation knows and understands relative to what it does not fully know, gives shape to the nature of debates around risk. In the latter context, organisations can be either aware or unaware, of the exact nature of their knowledge boundaries. Risk management should, in an ideal context, reflect the known elements around the hazard portfolio and it should allow for the determination of the probabilities of failure with a reasonable degree of reliability. In addition, the failure modes and effects associated with the hazard should be clear and understood. As we move into those areas where the balance between the established knowledge base and the unknown characteristics of the system shifts in the direction of the latter, then the uncertainty that this generates has the potential to incubate the potential for crisis and erode the organisation's abilities to manage hazards in an effective manner (Fischbacher-Smith, 2014a).

Within this uneven terrain of knowledge, there have been calls to widen the base of recognised sources of expertise (Michael, 1992). The result has been the emergence of 'citizen science' (Irwin, 1995, 2001) in which it is recognised that public groups often hold relevant and valid knowledge about the potential hazards generated by organisations (Irwin, Dale, & Smith, 1996; Wynne, 1992, 1996). This approach has the effect of changing the parameters of legitimised expertise, especially where the phenomena in question is poorly understood, and it challenges the traditional power and legitimacy of the various parties involved in risk debates (Fischbacher-Smith, Irwin, & Fischbacher-Smith, 2010). In those conflicts where the potential for harm is significant, it may lead to calls for a more precautionary

approach to dealing with the hazards (Calman & Smith, 2001; Fischbacher-Smith & Calman, 2010). Strategically, this generates challenges for organisations in terms of their abilities to anticipate public concerns about their activities and the abilities to communicate the nature of the risk to those who may be affected. These strategic processes are also framed within spatial and temporal settings and harms are often realised in a sense of place and it is to an examination of these interactions that the paper now turns.

Transforming hazards

A key element within the realisation of risk and the generation of harm relates to the processes by which transformations take place within the system. Systems are designed against a set of parameters and unless these parameters are reassessed on a regular basis, there will be the potential for the system to move from its designed for state into a state that is far from its equilibrium position. This can arise over space and time as adaptation can occur differentially in response to a range of perturbations. These perturbations, or disruptions, that impact upon the system have the effect of stimulating a response from the organisation either as local adaptations or through more systematic changes in operational protocols (Smith, 1995; Smith, 2005). Over time, organisations can adapt to these new ways of working but can fail to change their core protocols for dealing with the new set of conditions. Similarly, as the environment changes – moving from an ordered state, through complex to a chaotic one – it will generate different task demands that may exceed the organisation's abilities to respond in a timeframe that allows them to remain effective (Fischbacher-Smith, 2014b; Kauffman, 1993). It is this set of transformation processes that can move the organisation into crisis. There are several stages here.

In the first instance, organisations are faced with a set of environmental challenges that are either benign or threatening. The uncertainty inherent in this ambiguity can generate problems for the organisation at multiple levels. If these challenges are perceived to generate a threat to the organisation's current stability, then decision-makers within the organisation will seek to make sense of it and, in doing so, will deal with it through processes of enactment – the rules for systems use – in which previously held assumptions around the nature of threat-response relationships have generated a set of processes and procedures (controls) that shape

accepted forms of response (Hall, 1984; Hodge & Coronado, 2007; Smith, 2005; Tsoukas, 1999). For many types of events, the actions arise from a set of routine processes – possibly generating a condition of mindlessness - and occur as a function of the various individual or organisational scripts that guide behaviours and which are based on past experience (Ashforth & Fried, 1988; Cohen, Levinthal, & Warglien, 2014). However, there are also issues arising out of the relationships between the individual and the group – the notion of collective (group) mind (Weick & Roberts, 1993). The result of this process can generate phenomena such as groupthink (Esser, 1998; Janis, 1971, 1972) or paradigm blindness (Fischbacher-Smith, 2012, 2013) and in both cases, it may result in organisational decision-makers being unable to recognise the fundamental flaws in their decisions. This becomes especially significant in those settings where the task demands of the event move beyond the experience base of those making the decisions. In these cases, the selection of adaptive strategies becomes more problematic as previous experiences will not serve to guide behaviours, and the impacts of groupthink and paradigm blindness will impact upon the selection of alternative perspectives (that might run counter to the dominant paradigm) and shape group decision behaviours accordingly. The organisational recipes that arise from this process are often used as a means of shaping attempts at effectiveness (Bernard, 1998) but they may fail to work in a systems state that has moved away from that for which it was designed. Moving a system away from its designed-for state is a function of a number of factors that reflect the complexity inherent within the system and especially the speed and extent of those interactions. This reflects the processes identified by Perrow (1981, 1984, 2011) around tight coupling and interactive complexity and the potential that this has to generate the revenge effects identified by Tenner (1996). Figure 1 identified some of the main elements that typify the transformation processes that can move the system towards failure.

Space, place and time are also important transformational processes that can shape the dynamics of the harm that can arise from various forms of hazards. These hazards exist within space and are located in places. Time is an important element in shaping both exposure to the hazard and the framing of the population that will be placed at risk. Taken in its totality, a hazard generates harms across multiple distances, over different time frames, and across multiple spaces (either as levels within activities or across activities – which may be interconnected). Thus, risk

(which is the probability of a particular hazard occurring and the consequences associated with it) exists in space and time and is contextualised within a sense of place. This has the effect of generating different levels of risk across space and time, which will generate different levels of acceptability amongst those populations who are deemed to be at risk. From a strategic perspective, this introduces a further layer of complexity into the process.

Acceptability of risk

> "'riskiness' means more to people than 'expected number of fatalities'. Attempts to characterize, compare, and regulate risks must be sensitive to the broader conception of risk that underlies people's concerns" – (Slovic, Fischhoff, & Lichtenstein, 1982) p. 92.

The final group of issues raised in figure 1 concerns the processes that surround the acceptability of risk. Acceptability is shaped by the RIT components and can be seen as a function of the ways in which we make sense of the information that is available to us. This is shaped, in turn, by the paradigmatic and heuristic lenses that we use within the sense-making process and is also shaped by the transformations that take place at particular points in space and time. In addition, there are issues surrounding the comparability of certain forms of risk in affective the ways that individuals make judgements about their acceptability (Johnson, 2004). If, as some suggest, risk assessment is a social construction (Beck, 1992; Douglas & Wildavsky, 1982) then any ambiguities and uncertainty within the calculation of risk and its expression will have a potential impact on different levels of acceptability. The level of trust that those at risk have in those who are communicating the nature of the risk is also an important variable in shaping the processes around risk acceptability (Earle, 2010; Poortinga & Pidgeon, 2005; Smith & Irwin, 1984) as are the networks through which people communicate and make sense of the issues (Short, 1984).

In an increasingly globalised context, the notion of risk acceptability becomes even more problematic as hazardous activities can be exported in response to different regulatory environments and levels of public concern (Hudson, 2009; Nanda & Bailey, 1988). This exporting of hazard has been seen as a reflection of domestic practices in which low-income areas are often chosen to be the location for hazardous activities (Marbury, 1995; Pastor, Sadd, & Hipp, 2001). The diverse nature of such communities, especially within an international setting, can also play a role in shaping

the nature of the hazards as a result of impact of lifestyle and social behaviours on risk pathways (Dunn & Alexeeff, 2010). Such communities are also less likely to be able to deal with the power of polluting companies and regulatory authorities and this has the potential to lead to further forms of exploitation.

In addition to the spatial dynamics of acceptability, there are also issues around the population at risk. There are certain types of hazard that are deemed to be more unacceptable than others due to the perceived vulnerabilities of those affected. As with the export of hazards to less affluent countries or communities, the notion of a vulnerable population is increasingly seen as an important factor in shaping the acceptability of risk. Young children, the elderly, or other vulnerable populations, will often generate a lower level of tolerance in the wider community around the acceptability of risk because these groups are seen as being unable to resist any attempts at exploitation. The debates around the use of the MMR vaccine in the UK, for example, illustrates how problems can emerge around such vulnerable populations, especially where the standards of behaviour within professional groups was called into question (Clements & Ratzan, 2003).

As a result, the issues around risk acceptability become typified by their multi-level nature, the variations that can occur over space and time, and the effects generated around different populations at risk. Risk acceptability is intrinsically linked into the other elements of the RITA framework and it is the combination of the factors outlined in figure 1 that makes the incorporation of these issues into the strategy process problematic and difficult to deal with. It also raises issues around the ethical behaviours of organisations in terms of the ways in which they communicate risk and utilise expertise in the framing of risk communication (Collingridge & Reeve, 1986) and there is potential for the organisation's strategies to generate further conflict that may ultimately result in the onset of a crisis for the organisation. The interactions between the elements of the RITA framework are such that they generate a range of challenges for organisations, which are then configured as a consequence of the spatial and temporal settings in which they are set.

Conclusions

> "The learning that should follow failure often does not occur, and when it does occur, it often teaches the wrong lessons" – (Baumard & Starbuck, 2005, p. 295.).

The strategic nature of failures within organisations remains a potentially significant issue for management theory and practice. This chapter has sought to set out a range of issues that could be seen to account for the criticisms of organisational practices around the lack of synergies between risk, resilience and strategy (Mikes, 2009, 2011). The interconnections that exist between the activities of organisations serve to generate emergent conditions that have the potential to exceed the contingency plans that organisations have put in place. These perturbations have a significant impact on the performance of individual decision-makers within the organisation and raise issues around the incorporation of knowledge, uncertainty, and ambiguity within attempts to develop effective organisational strategies.

At the core of this process is the role and behaviours of human actors – both as decision-makers and enactors of organisational strategies. Within debates involving complex socio-technical systems, where there is a potentially high level of harm, there is often an overlay of technical expertise within the assessment of risk. In such cases, the potential for the incubation of errors within the decision-making process remains high. One antidote to these processes is often framed within the construct of organisational learning. This has been a constant theme within the risk literature but it does raise some important questions about the potential barriers that might exist to that learning (Smith & Elliott, 2007). If organisations are going to become more effective at integrating risk management processes within their strategies then they will need to develop more effective mechanisms for learning from the experiences of others, both within and outside of their own organisational boundaries. Within that context, the range of issues identified within the RITA framework provides a challenge to the learning capabilities that the organisation has in place.

The complexities associated with the RITA elements provide a set of parameters around which organisations should seek to develop their capabilities and ensure that staff, at various levels within the organisation, are familiar with the ambiguities that such elements generate. A failure to frame the RITA elements in a holistic way will ensure that the management of risk and the development of resilience will remain hampered by the fractured landscape that is developed as a result of a reductionist approach to dealing with the issues. Strategic management practice necessitates a greater degree of integration of the main concepts associated with risk and resilience with those that are core to the processes of strategic

management. Business education has a central role to play here, but it has largely failed to see this as a key set of debates within the undergraduate and postgraduate curriculum. Unless and until there is a wholesale increase in the awareness of the nuances around risk and the limitations that exist within the decision-making process around such issues, then the fractures between risk and strategy will persist.

The arguments developed here are only a first step in framing the parameters that underpin the dislocation between strategy and risk management. Further work is needed to test the issues identified here within an organisational setting and also to consider the implications that they might have for the education of managers in both risk and strategic management. Allowing the continuation of a gap between the key organisational functions or risk management and strategy will simply guarantee that organisational failures will continue to be incubated by those very people charged with preventing them. In that context, it is worth giving the last word to Barry Turner (1994b), who was a pioneer in the integration of risk management and strategy, who argued that:

> "…it is necessary to recognise that risk management is concerned with the management of uncertainty and not the management of certainty" (p. 155).

It is only by embracing such uncertainty that organisations will make more balanced decisions around the management of its risks and move towards becoming more resilient in the process.

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